

DISCUSSION OF THE AMENDMENT

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2007/0148374, when discussing the application description, both in this section and in the Remarks section, *infra*, rather than to page and line of the specification as filed.

Claims 1 and 30 have each been amended by incorporating an additional feature, as supported in the specification at paragraph [0021]. Claim 1 has been additionally amended by replacing the term “includes” with the synonymous --comprises--.

Claim 6 has been amended by adding --also--. Claims 17-20 have each been amended by inserting the term --detectable--, since Claim 1 does not contain a detection step. Claims 26 and 27 have been each amended by replacing “used to identify” with --capable of identifying--, and for Claim 27 additionally, -- . . . being--. Claim 28 has been amended by replacing “used as or in the manner of” with --capable of acting as--. Claim 36 has been amended by replacing “observed” with --observable--. Claims 41-43 have each been amended to claim an article comprising the recited CVD single crystal diamond material. Claim 53 has been amended, analogous to the amendment to Claim 28.

New Claim 75-79 have been added. Claim 75 is supported by Claim 3. Claims 76-78 are supported in the specification by Figs. 14-16, as described in the specification at paragraphs [0173]-[0178]. Claim 79 is supported by Claim 1.

No new matter is believed to have been added by the above amendment. Claims 1, 3-53 and 75-79 are now active in the application; Claims 54-74 stand withdrawn from consideration.

REMARKS

The rejections of Claims 1, 2-7, 11, 21-26, 29-35, 40-49 and 51-52 under 35 U.S.C. § 102(e) as anticipated by WO 03/014427 (Linares et al), and of the remaining active claims under 35 U.S.C. § 103(a) as unpatentable over Linares et al in view of other applied prior art, are respectfully traversed.

Applicants incorporate by reference all the arguments made in the previous amendment in traversal of the above-applied prior art.

While included in those arguments was that the present invention did not in any way impact on the properties of the diamond in application, the above-discussed amendment to Claims 1 and 30 now explicitly recites this feature. This is a clear distinction from Linares et al, which requires a significant change in the application properties disclosed for their CVD diamond by the addition of dopants (page 12, lines 15-22).

While the Examiner is technically correct that even adding a relatively small amount of dopant may change the average distance between carbon atoms, or may generally affect the molecular structure of the diamond, this is not the same as significantly affecting the application properties of the diamond. As disclosed and suggested by Linares et al, relatively greater amounts of chemical dopants are required in order to significantly affect application properties. This is true not only for the color changes disclosed by Linares et al, but all of the other applicable properties disclosed therein, be they strength, velocity of sound, electrical conductivity, or control of defects, as described therein at page 12, lines 6-8.

Thus, Linares et al does not disclose the subject matter of above-amended Claims 1 and 30 which relates to the inclusion of chemical dopants in a concentration which is not readily detectable under normal viewing conditions, does not affect the perceived quality of the diamond material under normal viewing conditions, and does not significantly affect the application properties of the diamond material.

The only disclosure in Linares et al with regard to providing a marker for identifying the origin of a diamond is the use of the isotope ^{13}C (page 21, lines 11-21). Linares et al fails to disclose or suggest such marking using chemical dopants as impurities. As these impurities and their effect on the properties of diamond are referenced throughout Linares et al, had Linares et al even contemplated that they could be used as a marker to identify the origin of a diamond, it is expected that it would have been explicitly described.

One of ordinary skill in the art reading Linares et al would understand that impurities can be added to diamond to change the application properties. There is nothing to suggest that it might be possible to mark diamond without significantly affecting the application properties. To the contrary, it is clear that using isotopes to mark as taught in Linares et al would have a dramatic effect on properties. For example, Linares et al discloses that diamond which has had its isotopic content enriched to 0.1% produces exceptionally high thermal conductivity (page 19 lines 10-12) and changing the isotope content will change the bandgap of the diamond with corresponding change in electrical properties (page 19 lines 21-26.) Thus, such a skilled person who does not want to alter the application properties of diamond would not consider using doping as described by Linares et al.

By the present invention, the inventors seek to provide a method of marking diamond which is not readily detectable under normal viewing conditions and does not affect the application properties. Hitherto, it had been known to mark diamond on the surface --see for example Gresser et al-- but such marks are visible on the diamond, damage its surface and can be removed by polishing. The present invention provides a method of marking which overcomes the disadvantages both of surface marking and of change in application properties.

In an informal discussion with the Examiner on February 19, 2010 in which above-amended Claims 1 and 30 were discussed, the Examiner indicated that such claims are still not patentable because marking is known in the prior art. Applicants' attorney replied that

while marking diamonds *per se* is old (Linares et al being one example), no prior art discloses or suggests marking in the way recited in the present claims.

None of the remaining applied prior art remedy the defects in Linares et al, because none disclose or suggest using chemical dopants for marking CVD diamond according to the protocol, for reasons already advanced, of record.

It is still true, as previously explained, that nothing in the prior art applied by the Examiner discloses or even suggests, conceptually or in a practical sense, that elements such as boron, nitrogen and silicon could be added to CVD synthetic diamond at controlled levels to produce a mark that enables simple detection, but that does not impart undesirable characteristics, such a color change and the like, to the material. The method of marking becomes an intrinsic feature of the diamond material, naturally incorporated into any product formed from that material, and retained even after subsequent re-processing, but which does not in any way impact on the properties of the diamond in application. There is no prior art indicating conception of such a technique, and no prior art which indicates that the difficult balance of achieving the mark without degrading the application properties of the diamond can be achieved. Such an achievement has been made in the present invention only after extensive inventive research. Applicants are of the view that the subject matter of the claims are not only new but also nonobvious over the applied art.

For all the above reasons, it is respectfully requested that the rejections be withdrawn.

The objection to Claim 5 [sic, Claim 6] as being an improper dependent claim in that it fails to limit the subject matter of a previous claim, is respectfully traversed. The limitation of Claim 6 is in addition to the limitations of Claim 5. See the specification at paragraph [0009], which describes that “[t]he nitrogen doped layer may **also** show a photoluminescence line at 533 nm” (emphasis added).

In response to the above argument, the Examiner states: "Claim 5 does not disclose a wavelength of 533 nm, only 537 or 637 nm! While support in the specification may exist, the claim lacks proper antecedent basis for having said wavelength. In sum, Applicant has not differentiated between their 'deliberate' process and one which 'accidentally' accomplishes the same result.

In reply, and as pointed out above, Claim 6 requires that a source of nitrogen be incorporated into the diamond such that it produces a mark of origin or fingerprint that shows 575 nm and/or 637 nm luminescence peaks, with their associated vibronic systems, under suitable shorter wavelength excitation, **and** that the mark of origin or fingerprint show a photoluminescence line at 533 nm. There is no lack of antecedent basis, because the photoluminescence line of Claim 6 does not modify the luminescence peaks limitation of Claim 5, but rather adds an additional limitation.

Regarding the last-quoted sentence, it is not clear if this finding refers to the above-discussed objection or to the present claims generally. To the extent the Examiner intends it to apply to the claims generally, the prior art does not accidentally or otherwise carry out the presently-claimed method, or produce a CVD single crystal diamond material having the recited properties.

Accordingly, it is respectfully requested that the objection be withdrawn.

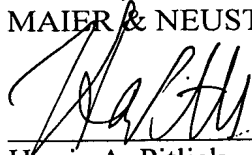
Submitted herewith is an Information Disclosure Statement. A number of those documents were cited in an opposition to the corresponding patent application before the EPO. Included in the opposition is reference to a James Bond film, "Die Another Day," (erroneously called "Tomorrow Never Dies" in the translation of the opposition filed herein). The film has not been listed on a Form PTO 1449, for obvious reasons.

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All of the presently-active claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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